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WELCOA'S ONLINE GENERAL WELLNESS BULLETIN

PHYSICAL ACTIVITY & ALZHEIMER'S

What New Data Is Showing Us

Can exercise change how your brain works? A new study suggests that how, and how often, older adults exercise could impact breakdown of glucose in the brain. Decreases in brain metabolism (hypometabolism) have been shown to be a characteristic of Alzheimer's disease and predictive of cognitive decline and the conversion to Alzheimer's in older adults. Physical activity has been shown to modulate brain glucose metabolism, but it is unclear what level of intensity and duration may be beneficial.

A recent NIA-supported study from the University of Wisconsin led by Dr. Ozioma Okonkwo found that even moderate physical activity may increase metabolism in brain regions important for learning and memory. The study asked cognitively normal, late-middle age (average age 64 years old) participants to wear an accelerometer for 7 consecutive days to measure daily physical activity. Scientists were then able to determine the amount of time each individual engaged in light (e.g., a slow walk), moderate (e.g., a fast walk), and vigorous activities (e.g., run). The physical activity data were analyzed to determine how they corresponded with glucose metabolism within brain areas that have been demonstrated to be impacted in people with Alzheimer's.

Increasing levels of engagement in moderate physical activity were associated with increases in cerebral glucose metabolism across all brain regions examined. Vigorous activity showed an increase in metabolism only in the hippocampus (an area important for learning and memory). Light physical activity was not associated with changes in metabolism in any of the brain regions examined. Further, how long one engaged in moderate physical activity impacted the amount of brain glucose metabolism. The more time spent performing moderate level of physical activity (average 43.3 min/day to average 68.1 min/day), the greater the increase in brain glucose metabolism.

Overall, this study adds to encouraging evidence that physical activity may be beneficial for neurometabolic function. Specifically, it makes a critical contribution to the efforts to identify the intensity and duration of physical activity that confer the most advantage for combating Alzheimer's-related changes in mid-life.

WHAT IS ALZHEIMER'S DISEASE?

Alzheimer's disease is an irreversible, progressive brain disorder that slowly destroys memory and thinking skills and, eventually, the ability to carry out the simplest tasks. In most people with the disease—those with the late-onset type—symptoms first appear in their mid-60s. Early-onset Alzheimer's occurs between a person's 30s and mid-60s and is very rare. Alzheimer's disease is the most common cause of dementia among older adults.

The disease is named after Dr. Alois Alzheimer. In 1906, Dr. Alzheimer noticed changes in the brain tissue of a woman who had died of an unusual mental illness. Her symptoms included memory loss, language problems, and unpredictable behavior. After she died, he examined her brain and found many abnormal clumps (now called amyloid plaques) and tangled bundles of fibers (now called neurofibrillary, or tau, tangles).

These plaques and tangles in the brain are still considered some of the main features of Alzheimer's disease. Another feature is the loss of connections between nerve cells (neurons) in the brain. Neurons transmit messages between different parts of the brain, and from the brain to muscles and organs in the body. Many other complex brain changes are thought to play a role in Alzheimer's, too.